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ABSTRACT

A curricular and instructional framework for increasing the vocabulary skills of diverse learners is described. Areas of convergence in research literature on vocabulary learning and diverse learners are noted, and two recommendations based on these areas of convergence are offered: interventions to address the vocabulary delays of diverse learners should align goals for depth of word knowledge with instructional techniques; and interventions to increase vocabulary knowledge of diverse learners should move systematically toward ensuring that students become independent word learners. Five principles of instructional design are then discussed: conspicuous strategies, strategic integration, mediated scaffolding, priming background knowledge, and judicious review. For diverse learners, it is suggested that vocabulary instruction helps in learning many words at the level of verbal association and fewer words at the level of partial and full concept knowledge. Vocabulary instructional approaches which apply the principles of instructional design are considered, such as semantic mapping, computer assisted instruction, student practice of words that have been learned in multiple subject areas or learning contexts, using external supports and materials during initial learning, helping students draw on their personal experiences to understand new information, and reviewing previously learned words. (Contains 18 references.) (SW)

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National Center to Improve the Tools of Educators

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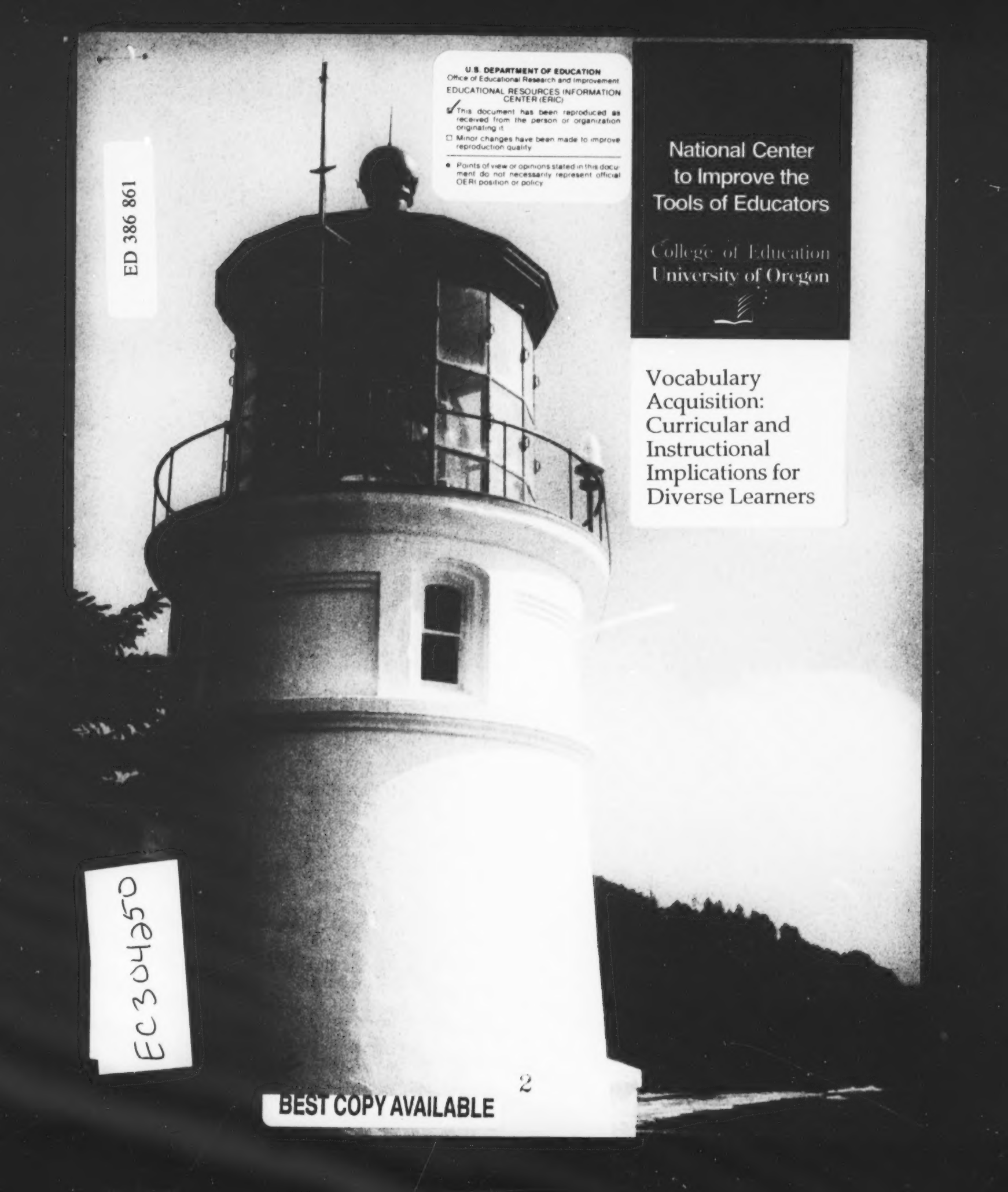
Vocabulary Acquisition: Curricular and Instructional Implications for Diverse Learners



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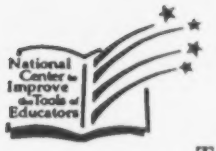

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Vocabulary Acquisition: Curricular and Instructional Implications for Diverse Learners

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Running Head: VOCABULARY ACQUISITION IMPLICATIONS

Vocabulary Acquisition: Curricular and Instructional Implications for Diverse Learners

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Review of Converging Evidence

Early literacy acquisition is fundamental to school success and long-term social, vocational, and economic adjustment. Many students, including a growing percentage of diverse learners, depend largely on the quality of instruction in the early primary grades to develop the literacy skills needed for school success. The importance of early reading and writing instruction has been heavily publicized. In contrast, vocabulary development, although clearly recognized, has not received the same degree of instructional attention as other literacy skills. After all, "vocabulary development" is not an academic subject like reading, mathematics, and science. However, although vocabulary development pervades every subject from reading to mathematics to physical education, it is difficult to isolate for instructional purposes. Still, a lucid argument can be made for a much more active and vigorous educational commitment to increasing the vocabulary growth of diverse learners who often experience vocabulary problems and delays.

Based on our research synthesis on vocabulary acquisition (Baker, Simmons, & Kameenui, 1995), five areas of convergence were identified that have implications for vocabulary development in daily instructional routines:

- Vocabulary differences between students are extensive. Differences arise early, and the vocabulary gap between students grows larger over time.
- Researchers have attempted to identify critical factors that contribute to individual differences in vocabulary growth. Most explanations center on student characteristics that can be grouped into three categories: generalized linguistic deficiencies, memory deficits, and poor word learning strategies.

- Instructional procedures to teach word meanings should be consonant with goals for depth of word knowledge.
- Various instructional methods have led to increases in students' knowledge of individual words, beyond gains that could be expected from typical incidental learning opportunities. However, a single best method of vocabulary instruction has not been identified.
- Students need strong beginning reading skills to engage successfully in the volume of reading necessary to gain exposure to and possibly learn large numbers of word meanings from independent reading of connected text.

In this paper, we discuss the implications of these areas of convergence in relation to a framework of curriculum design principles that has received empirical support for enhancing the academic achievement of diverse learners. Referring to the major guidelines of the vocabulary framework as big ideas, we use the validated instructional principles of conspicuous strategies, strategic integration, mediated scaffolding, primed background knowledge, and judicious review to render these big ideas more explicit and employable.

In considering the research support for vocabulary development, it is necessary to reiterate an important point made in our research synthesis on vocabulary acquisition (Baker, Simmons, & Kameenui, 1995): Successful vocabulary interventions can be judged by whether they result in increased word learning above what might otherwise occur during typical incidental and explicit learning opportunities; or they can be judged more broadly, to the extent that they meaningfully reduce the gap between students with poor versus rich vocabularies. The instructional framework we present is designed to address both of these criteria for success. Most persuasive, however, will be evidence that the more comprehensive goal of reducing the vocabulary gap between students has been attained.

In the next section, we describe big ideas from our research synthesis on vocabulary acquisition that are instructionally important and empirically validated. We attempt to connect research and practice by responding to two focus questions: (a) What are the research-based instructional priorities or "big ideas" in vocabulary development? and (b) For the instructional priorities of vocabulary development, what is the existing research evidence regarding curriculum design?

Although there is research support for each of the vocabulary intervention techniques we discuss, the framework we propose to comprehensively address the vocabulary delays of diverse learners is based more on a logical analysis of the problem than clear and warranted research evidence. Comprehensive vocabulary programs have been discussed in numerous secondary sources (e.g., Baumann & Kameenui, 1991; Beck & McKeown, 1991; Graves, 1986; Kameenui, Dixon, & Carnine, 1987; McKeown & Beck, 1988), but the effectiveness of comprehensive vocabulary development programs that address the needs of diverse learners has not been investigated. The following section should not be viewed as a prescription, but rather as an application of principles that can be used to make tangible the details and relations of instruction for students with diverse learning needs.

Research Based Instructional Priorities in Vocabulary Acquisition: Big Ideas

From the five areas of convergence, we have derived two big ideas that we believe successfully frame the major guideposts of comprehensive vocabulary instructional programs for diverse learners.

1. Interventions to address the vocabulary delays of diverse learners should align goals for depth of word knowledge with instructional techniques.

Goals for word knowledge correspond to the "depth of knowledge" an individual has about a word's meaning. This depth includes knowledge of the different contexts in which a word is used (e.g., the 26 contextual uses of the word set

as a verb, 6 uses of set as a adjective, and 9 uses of set as a noun; American Heritage Dictionary, 1992), and familiarity with critical features that define a word's meaning (e.g., parka is a garment, is used in cold weather, has a hood, and is frequently used in the rain) (Anderson & Nagy, 1991). Depth of word knowledge covaries with the requirements of the task used to assess knowledge, and an individual does not need to know all definitions of a word and all its contextual meanings to use a word successfully. What is important is that instruction parallels the expectation of word usage.

"Depth of word knowledge" can most accurately be represented on a continuous scale ranging from (a) little or no understanding of a word's meaning to (b) full understanding. Numerous authors have used terms corresponding to minimal, partial, and full knowledge to describe qualitatively different levels of word knowledge (e.g., Baumann & Kameenui, 1991; Beck & McKeown, 1991; Graves, 1986; Kameenui et al., 1987). We will use Baumann and Kameenui's (1991) descriptors, verbal association knowledge, partial concept knowledge, and full concept knowledge, to discuss depth of word knowledge and its relation to instruction.

The minimum level of knowledge is verbal association knowledge, which enables a person to link a new word with a specific definition or a single context. In full concept knowledge, an individual understands and can use a word in novel instances, knows the varied meanings of multiple-meaning words, and is able to discriminate a word's meaning from the meanings of other similar words. Partial concept knowledge falls between verbal association knowledge and full concept knowledge. Specifically, an individual may be able to use a word in a limited number of ways, understand some of the meanings of multiple-meaning words, and have difficulty discriminating a word's meaning from the meanings of other similar words.

We interpret the vocabulary research as suggesting that the goals for vocabulary knowledge should guide instructional technique. In Figure 1, we present a guideline for evaluating the "fit" between goals for depth of knowledge and instructional techniques that have been supported empirically. Obviously, in something as fluid and dynamic as vocabulary knowledge, a comfortable "fit" between goals and instructional techniques requires considerable flexibility. However, the guideline should be useful when considering the value and efficiency of instructional choices.

Insert Figure 1 here

For example, the keyword method is more likely to result in verbal association knowledge than full concept knowledge. This is true because, by definition, the keyword method teaches the association between a target word and its predominant definition. At the other end of the continuum, a procedure such as McKeown and Beck's (1988) rich instruction includes a variety of procedures to facilitate partial and full concept knowledge, including generating definitions and sentences, classification tasks, oral and written production tasks, game-like tasks, and tasks that stress the relations between target words and previously acquired vocabulary. In rich instruction, the goal is for students to learn word meanings at a deep level of understanding. Each method, whether keyword, semantic maps, rich instruction, etc., has empirical support, yet its value must be evaluated in light of the task and textual expectations.

2. Interventions to increase the vocabulary knowledge of diverse learners should move systematically toward ensuring that students become independent word learners.

Students learn approximately 3,000 words per year during the early grades. Obviously, it is educationally impossible for students to learn even a sizable portion

of these new words through direct instructional approaches. Instead, students must and do learn word meanings independently. However, the vocabulary gap between students with poor versus rich vocabularies expands yearly throughout students' academic careers, clearly indicating that some students are better word learners than others. Thus, the second big idea in a comprehensive vocabulary development program is that students with poor vocabularies, including diverse learners, need strong and systematic educational support to become successful independent word learners. For many students, the critical framework that helps pave the way to successful independent word learning skills is established early through exposure to written text and development of strong skills in reading and writing. With diverse learners, however, the foundation for vocabulary learning independence requires systematic instruction that occurs early and is applied intensely for a long period of time.

Students develop an extensive lexicon prior to learning a print system (Beck & McKeown, 1991). However, reading is probably the most important mechanism for vocabulary growth throughout a student's school-age years and beyond (Anderson & Nagy, 1991; Baumann & Kameenui, 1991). Around kindergarten and first grade, typical students know between 2,500 and 5,000 root words (Beck & McKeown, 1991), the vast majority of which are high-frequency, utilitarian words. An increasingly large percentage of the approximately 3,000 words students learn per year in the early primary grades are more complex, infrequently used words reserved primarily for specialized academic activities. Reading allows students to "reflect" on the meaning of these types of words in a way that speech cannot.

Thus, a comprehensive vocabulary development program that meets the needs of diverse learners should (a) teach words that are strategic to academic success and not typically acquired independently, and (b) include systematic procedures to make

students independent word learners, primarily by helping them become voracious readers (Anderson & Nagy, 1991).

Evidence of Curriculum Design in Vocabulary Acquisition

Conspicuous Strategies

Strategies are sequences of teaching events and teacher actions which make explicit the steps that enable a learner to achieve an outcome. In vocabulary development, for example, strategies represent procedures to facilitate (a) word learning at a desired level of understanding, and (b) independence in the implementation of word learning strategies. Many students develop efficient vocabulary learning strategies on their own. Research indicates, however, that diverse learners are likely to develop the same strategies as their normal achieving peers, but tend to use them less efficiently (Griswold, Gelzheiser, & Shepherd, 1987). By making strategies conspicuous, teachers can better understand where, why, and how strategy use succeeds and fails.

Matching vocabulary goals with instruction. For diverse learners, a comprehensive vocabulary development program should include goals for learning many words at the level of verbal association and fewer words at the level of partial and full concept knowledge (McKeown & Beck, 1988). Goals incorporating multiple levels of understanding are important in order for students (a) to learn the words necessary to decrease the gap between themselves and their normally achieving peers, and (b) to develop a larger lexicon of words at sufficient depth to be part of students' expressive, everyday vocabulary.

Determining which words to teach at the level of verbal association, partial concept knowledge, and full concept knowledge is critical. Factors influencing this decision include (a) the general importance of the word in everyday use; (b) the importance of the word in more specialized, academic use; (c) the student's current knowledge of the target word and semantically related words; and (d) characteristics

of the word that are more conducive to certain kinds of instructional techniques, such as the keyword method or semantic mapping. The overriding principle in these four considerations is the need to balance the importance of word knowledge with the purpose, effectiveness, and efficiency of instructional techniques.

For example, teachers might use the story The Polar Express (Van Allsburg, 1985) in the early primary grades to teach students word meanings using multiple conspicuous strategies. This might occur during shared story reading. At the verbal association level, teachers may increase the meaningfulness of the story for students, including diverse learners, by teaching numerous words as they occur in the context of the story. For instance, the words rustle ("I did not rustle the sheets") and hissing ("From outside came the sounds of hissing steam and squeaking metal") appear early in the story and might be difficult for some students to understand. The meaning of these words can be clarified for students by simple explanations that rustle means move and hissing is a sharp sound like that made by a train. Rustle and hissing do not appear again in the story and are not integral to the story's meaning, yet they are interesting and can be taught efficiently, meaningfully, and conspicuously at the verbal association level.

Many teachers may believe that reading a story in this manner interrupts the flow of the story and, therefore, makes it more difficult for students to understand and appreciate. Two points are critical regarding this issue. First, teaching word meanings during story reading may come after the story has been read through once without interruption. Second, vocabulary-building activities can be conducted in the context of interactive reading, which most educators agree is an important component of shared story reading. Interactive reading allows students to be active participants in the story and enables teachers to model and gauge reading comprehension and vocabulary understanding. Teaching word meanings at the verbal association level first and foremost reinforces the basic importance of

knowing the meaning of words; however, it also provides an opportunity for teachers to model how word meanings depend to a great extent on the context in which the word is used. At a more abstract level, students may begin to develop an awareness that a word's meaning is determined by a combination of its relatively permanent standard "definition," as well as the less definitive contextual restriction in which it is used.

At the other end of the continuum, The Polar Express contains important words that teachers might want to teach at a deeper level of understanding. Two examples are sleigh and conductor, which are used repeatedly and are integral to the story's meaning. Sleigh and conductor are words the students may have some knowledge of already, which should facilitate their being learned at a deeper level of understanding. A technique such as semantic mapping might help students learn these words at a level of understanding beyond verbal association. Sinatra, Berg, and Dunn (1985) presented one way to use semantic maps that classroom teachers may find useful. For the word conductor from The Polar Express, the semantic map might focus on comparing train conductors and other individuals responsible for operating passenger transportation systems, such as airplane pilots, ship captains, and bus drivers.

Similarly, a semantic map for sleigh might be constructed in which sleigh is presented as one vehicle in a class of vehicles (e.g., cars, horses, bikes, boats) and also, perhaps, as one toy in a class of toys (e.g., bike skates, skis, surf boards). More specific knowledge goals might restrict the semantic map to vehicles and toys used in the snow. The conspicuousness of these strategies is demonstrated in the way teachers help students make the connection between words and concepts, as dictated by student responses and the extensiveness of their answers. In addition, the extensiveness of instruction would dictate the depth of knowledge children were likely to attain for particular target words. For example, deeper levels of knowledge

might be attained if (a) students wrote stories with conductor or sleigh as important themes, (b) learned the parts of a sleigh, (c) learned different meanings of conductor, or (d) learned about the root word, conduct.

Enhancing independent vocabulary growth. For good reason, few things give educators as much satisfaction as watching a young skilled reader "devour" books. Early reading success is the clearest path to academic achievement and life-long learning. Also for good reason, few things are as painful to educators as students who struggle and ultimately fail to learn to read proficiently. Reading failure is a clear path to academic difficulty and is related to numerous debilitating long-term consequences including school dropout, teenage pregnancy, crime, unemployment, and economic hardship.

In relation to vocabulary development, the single most important contribution to independent word learning is ensuring that students develop strong word-recognition skills in first and second grade. By the end of second grade, students' word-recognition skills should be sufficiently automatic so that they are focusing on the primary purpose of reading: to derive meaning from text (Adams, 1990). When students are focusing primarily on reading comprehension, attention can turn from vocabulary learning techniques that are primarily teacher driven to techniques that are primarily student driven.

In many ways, the critical aspect of a smooth transfer from teacher-driven, conspicuous strategies to independent student activities is the extent to which students learn to effectively use the vocabulary learning strategies that teachers modeled during shared story reading: noting the importance of word meanings, analyzing word meanings in the context of surrounding contextual information, using tools such as dictionaries and glossaries, creating semantic maps to understand the relations between words and concepts, and recognizing that some words require a deeper understanding than others for greater story appreciation.

Students can begin to learn word meanings independently by reading connected text, either on their own or with a teacher. During early reading instruction it may be valuable if teachers monitor how students incorporate vocabulary learning strategies so they can reinforce students for engaging in these activities correctly. A second, and potentially very useful, approach is to have students engage in vocabulary-growth activities with the assistance of computer programs. Two recent studies demonstrated the effectiveness of using computers to build vocabulary knowledge (Johnson, Gersten, & Carnine, 1987; Reinking & Rickman, 1990). The Reinking and Rickman study addressed building vocabulary knowledge in the context of story reading. Students read stories displayed on a computer screen. Difficult words were highlighted and their contextual meanings were automatically presented when students scrolled to the relevant sections of the passage.

A number of validated benefits and potential benefits are associated with the use of computers to build vocabulary knowledge during reading. First, students can easily access the meaning of words they do not know, typically at the level of verbal association knowledge. Computer applications also have the potential to increase student depth of word knowledge. For example, helping students understand the relation between words through semantic maps seems especially suited to computer software.

Many students develop effective word learning strategies independently. Not only do some students develop the effective use of multiple strategies, such as analyzing a word in context and developing overt or covert semantic maps highlighting the relations between words, but they also develop an awareness of how much knowledge is required to understand and use word meanings according to learning demands. For diverse learners, however, the strategies that students with strong vocabulary skills use to learn word meanings need to be made conspicuous. The steps need to be sequenced efficiently and effectively, and the

relevance of the vocabulary tasks must be clearly tied to important learning outcomes.

Strategic Integration

Strategic integration refers to the planning, consideration, and sequencing of vocabulary tasks to promote vocabulary development. New information that is integrated strategically with previously learned information and across learning settings has the greatest likelihood of being retained over time. In vocabulary development, this occurs (a) by having students practice words whose meanings they have learned in multiple subject areas or learning contexts, and (b) by systematically building new word knowledge on previous word knowledge. The research support is clear that to incorporate new words into their receptive or expressive lexicons, students need multiple exposures to words and multiple opportunities to practice using words.

Matching vocabulary goals with instruction. A simple rule of thumb, based on research evidence and logical analysis, is that the greater the depth of knowledge of a word's meaning that is sought, the more important it is to use that word in multiple contexts. For example, Ms. Reyes, a middle-school teacher, wants her students to understand the term economics at a deep level. Ms. Reyes first teaches the definition of economics at the beginning of the year as the "study of things having to do with earning and spending money." Slowly, deeper understanding of economics is achieved by integrating the term into the history curriculum through a problem-solution-effect model of instruction, in which the problems peoples have had historically are represented as stemming from two fundamental causes: economic problems and human rights problems (Carnine, Crawford, Harniss, & Hollenbeck, 1995). Examples from history and current events that highlight how problems can be tied to an economic component (e.g., the American Revolution, Germany's aggression in WWII, Iraq's invasion of Kuwait) set the stage for a deeper

understanding of economics. Further integration can occur by having students consider (a) the ways their lives are affected by economic forces, (b) an upcoming election from an economics perspective, (c) how parsimony in science and math can be conceptualized as economical, and (d) the politics of capitalist, socialist, and communist countries in terms of classic economics theory.

In an example more applicable to the primary grades, strategic integration of word knowledge at the level of verbal association might occur through an activity in which teachers identify two or three daily target words to which they will expose their students throughout the day during typical classroom routines and interactions. For example, three target words on one day might be certain, compromise, and twilight. These words could be used by the teacher during daily classroom conversation (e.g., "Be certain to clean your work areas before you leave for recess"), planned activities (e.g., presenting a potential problem in which students have to discuss how compromise can be achieved), or spontaneous informal assessment ("Jeremy, at one time of day is it twilight?").

In developing knowledge at the verbal association and partial concept levels, it is important to systematically and strategically integrate the vocabulary teachers use throughout typical classroom activities. This strategy may significantly increase the opportunities students have to learn the meanings of important words. Unfortunately, although recommended (Baumann & Kameenui, 1991; Graves, 1986), the empirical base for the vocabulary effects of oral exposure to language has not been investigated in recent vocabulary research. We consider this a key research area to enhance the vocabulary development of diverse learners in the early primary grades.

Enhancing independent vocabulary growth. One of the best ways to facilitate greater independence in vocabulary growth is through the strategic integration of vocabulary learning opportunities in multiple curricular areas. In many ways, the

concept of an integrated curriculum corresponds closely to what is known about vocabulary learning in general. That is, to develop more extensive vocabularies, students need multiple opportunities to practice using new words. Such opportunities might be a likely consequence of a curriculum that is more thematically than subject-based, which is a likely result of an integrated curriculum.

For example, much has been written about the positive benefits of integrating reading and writing opportunities to facilitate early literacy acquisition. In fact, it is common in whole-language classrooms for students to develop beginning reading skills by reading their own compositions. Writing facilitates student independence in vocabulary acquisition, because it is fundamentally an individual experience, and through its deliberate pace and ease of modification and change, a writer can choose words carefully and reflectively. Teachers who are able to challenge students to use opportunities to write as the context for extending their vocabulary development are likely to facilitate broad and deep vocabulary growth.

Little research has been conducted on general vocabulary growth resulting from student writing opportunities. Reading research does show, however, a positive relation between the number of times an individual is exposed to a word and the likelihood that the individual learns the meaning of the word. In the context of challenging writing opportunities, it seems that not only might students be exposed to words multiple times, but the context in which such exposure occurs may facilitate deeper reflection on word meanings than occurs typically during speech or reading opportunities.

The integration of reading and writing to promote independent vocabulary growth may apply to content area subjects. In this case, the strategic integration of reading, writing, and content area knowledge should enhance both general and content-specific vocabulary growth. For example, asking students to read about current models of government and then to write about the similarities and

differences between them by comparing and contrasting democratic republics, socialist republics, and communist republics might result in students learning and using important vocabulary terms such as capitalism, market-oriented, laissez-faire, distribution, welfare, state controlled, congress, legislation, and economics.

Mediated Scaffolding

Mediated scaffolds are external supports provided by the teacher, tasks, and materials during initial learning. In vocabulary development, for example, there is a close relationship between mediated scaffolding and conspicuous strategies. The main idea behind mediated scaffolding is to (a) provide as many strategic steps as necessary for the student to learn a word's meaning, and to (b) systematically remove the support or scaffolding as the student's knowledge develops. Greater teacher support is generally associated with more conspicuous teacher demonstrations of strategy use.

Matching vocabulary goals with instruction. In vocabulary development, the type of scaffolding provided depends on two things--the strategy used and the depth of knowledge desired. For example, when the keyword method is used, verbal association knowledge is typically desired; therefore, this method is most appropriate for words that are not known or only partially known. The instruction includes providing (a) a definition of the target word, (b) the keyword, and (c) the image that connects the target word with the keyword. The image has to be chosen carefully because unless students clearly associate the keyword with the image, and the image with the definition, students are unlikely to recall the meaning of the target word.

Pressley, Levin, and McDaniel (1987; cited in Baumann & Kameenui, 1991) presented an example in which the word carlin, which means old woman, was taught using the keyword method. The keyword for carlin was car, and the image for accessing the definition was an old woman driving a car. This type of support

represents a strong degree of scaffolding. To date, research with the keyword method has not determined whether students can generate the necessary components of keyword instruction to learn word meanings successfully. If possible, this would reduce the amount of scaffolding required. Current findings indicate that the keyword method works with a great deal of teacher scaffolding and, consequently, may need to be reserved for critical words that are not typically or effectively acquired through other methods requiring verbal association knowledge. For instance, in a study by Mastropieri, Scruggs, and Fulk (1990), the words chosen were not high-frequency words (e.g., oxalis, carnelian, soutache, vituperation, octroi, nescience) and, thus, might be learned satisfactorily at a level of verbal association knowledge.

Other strategies at the verbal association level, such as definition, contextual analysis, and computer-assisted instruction, may require a great deal of early scaffolding, which is reduced as students develop the skills to use the methods independently. In these cases, procedures to reduce the amount of scaffolding are straightforward. The text itself frequently incorporates naturally occurring scaffolding that teachers can capitalize on to help reinforce words through contextual analysis. For example, the following sentences from Charlotte's Web (White, 1952) and The Polar Express (Van Allsburg, 1985) provide a "rich" amount of information to determine the meaning of the target words:

- "Everybody lined up at the fence and stood for a moment admiring Wilbur and the beautiful green crate" (White, 1952, p. 125; from this sentence admiring can be taken to mean liking what one is looking at).
- "We sang Christmas carols and ate candies with nougat centers as white as snow" (Van Allsburg, 1985, p. 7; from this sentence carols can be taken to refer to a type of song that has something to do with Christmas).

To suggest that these sentences include a "rich" amount of information means that the sentence itself provides useful support in determining the meaning of the target word. In contrast, many sentences provide "lean" information for determining the meaning of a target word. For example, the following sentences provide less scaffolding than the previous two:

- "It is not easy to look radiant, but Wilbur threw himself into it with a will" (White, 1952, p. 114).
- "Fern's sneakers were sopping by the time she caught up with her father" (White, p. 2).

These sentences provide a "lean" amount of information to indicate the meaning of the target word. Obviously, information in previous or later sentences may provide useful clues, but in general, the more removed the information is from the target word, the greater the contextual analysis skills required of the learner.

For diverse learners, teachers might begin by utilizing "rich" contexts as a means of scaffolding instruction. As students develop contextual analysis skills, contexts can become systematically more "lean."

In cases where deeper levels of word knowledge are desired, scaffolding might be used to help students establish relations between words. For example, in creating semantic maps, relevant categories might be determined initially by the teacher, such as modes of transportation and winter sports activities for developing greater understanding of conductor and sleigh. To remove a layer of scaffolding, students as a group might generate categories to teacher-supplied words. In a less scaffolded condition, students might generate the semantic map categories independently. Eventually, students might assume responsibility for identifying the target words they believe are most important in understanding the text, as well as the categories that will help facilitate deeper vocabulary understanding.

Enhancing independent vocabulary growth. To achieve independent word-learning strategies, the goal is to provide enough scaffolding so that students develop independence, but not so much that they become reliant on external support. In most instructional activities, it should be clear that students are assuming greater independence in vocabulary development. For example, written compositions should reflect increasingly diverse and rich vocabulary. Students also should be able to demonstrate the reading strategies they use to determine the contextual meaning of a word, how to construct a semantic map indicating the relation between words, and verbally define and explain the meaning of important words. If students are unable to demonstrate these types of skills when requested, it may be an indication that they need more support and guidance in learning the meanings of new vocabulary words.

As with the match between vocabulary goals and instructional methods, scaffolding can be provided to help students achieve greater learning independence in two ways: (a) through direct teacher intervention, or (b) through modifying or changing curriculum materials. For example, teachers might directly increase the amount of scaffolding provided to students by specifying the vocabulary words they want them to know from a particular story, rather than having students identify and learn the most important words independently.

Similarly, if computers are being used to facilitate reading and vocabulary acquisition, scaffolding might be provided by having the computer software rather than the student determine which word meanings are defined on screen. In the Reinking and Rickman (1990) study, middle-school teachers identified words in reading passages they believed would give typical sixth-grade students difficulty. The authors found that the diverse learners who were required to view the meaning of these vocabulary words on screen as they read the passage learned more word meanings than diverse learners who determined the words themselves.

Priming Background Knowledge

Priming background knowledge helps students draw on their personal experiences as a means to understand new information. In many cases, teachers may help students acquire the necessary background knowledge to learn critical information or skills. In facilitating vocabulary growth, it is helpful to activate student background knowledge when considering the match between vocabulary goals and instructional strategies, and when promoting word-learning independence.

Matching vocabulary goals with instruction. Priming background knowledge is essential when considering the match between vocabulary goals and instructional techniques. As Adams (1990) noted, learning anything only occurs in the context of what the learner already knows. At the level of verbal association, for example, telling students that elated means happy assumes that they know the meaning of happy. Teaching the meaning of the word atom at a deeper level of understanding than a verbal association level (i.e., "a tiny particle") requires background knowledge of the term atom. If the goal is for students to understand the role of atoms in how atom bombs are made, how nuclear energy works, what fission means, or how atoms are configured and arranged structurally, then students must know something about electrons, protons, and neutrons. In other words, students need background knowledge about the structure of atoms to learn about them at a deeper level of understanding.

In general, the deeper the understanding desired about the meaning of a word, the more background knowledge a student needs. If sufficient background knowledge does not exist, it may be necessary to teach it directly or to arrange for students to acquire it through reading or other independent activities.

It is reasonable, and perhaps sometimes desirable, to provide students with instruction and other learning opportunities that enable them to acquire

background knowledge and a deep understanding of a word's meaning nearly simultaneously. This is most true in subjects such as science, where much of the content and related vocabulary tends to be restricted to subject-specific discussions. For example, instruction related to the meaning of the word atom might begin at the verbal association level and proceed directly toward full concept knowledge. The overriding concept on which the instruction is based might be elements of matter, which requires an understanding of the terms elements and matter. The definition of atom might then proceed quickly to schemata of its structure with examples of various atom types. Finally, practical applications of the behavior of sub-atomic particles might be explored. For more literary, abstract, or widely used words such as democracy and perseverance, it may be more difficult to achieve a deep understanding because their meanings are closely tied to students' experiences and background knowledge, which varies widely from student to student.

Enhancing independent vocabulary growth. One of the great challenges for educators in the early primary grades is helping students become independent learners. Independent learning in general cannot be separated from student independence in learning new vocabulary. Like learning in general, the amount of independence students assume for learning word meanings is integrally tied to mediated scaffolding. To a large extent, classroom teachers in the primary grades should provide strong scaffolding to help students develop the knowledge they need to become independent academic learners. This may be done by arranging early instructional opportunities that capitalize on students' natural curiosity to learn. Considerable scaffolding may be needed as learning requirements assume a more academic focus. For example, as students begin to develop academic background knowledge, they can become increasingly independent for learning more complex skills such as reading comprehension and vocabulary learning strategies.

For example, as a precursor to writing their own stories, first-grade students might discuss a particular story based on the pictures in an illustrated book. Then, as the teacher reads the story, the students and the teacher can discuss these initial predictions in relation to actual content. This type of activity helps students develop the background knowledge they need to (a) write the story they just read and discussed, and (b) begin writing stories they develop on their own. Considerable scaffolding may be required for students to "write" about stories that have been read to them or that they make up on their own, but most students steadily improve in the degree of independence they assume in this activity as well. Thus, discussing the possible story content from pictures and comparing such predictions to actual content helps students develop some of the background knowledge they need to be able to write independently. In turn, independent story writing provides some of the background knowledge students need to begin using their writing opportunities to expand their vocabulary use.

Judicious Review

Judicious review refers to the review and application of previously learned information that is carefully distributed, cumulative, and varied. One of the advantages of vocabulary development is that incorporating new words in an active lexicon allows for a natural "review" of previously learned vocabulary. In other words, because speaking is an activity that most individuals engage in frequently and consistently throughout typical everyday experiences, if new vocabulary words are to become part of a student's everyday lexicon, then periodic opportunities to use new words should occur. With infrequently used words, review activities must be planned to avoid that word meanings are forgotten.

Two issues in relation to diverse learners are important in this regard. First, diverse learners may be less likely than normal achievers to make new vocabulary words part of their active lexicons unless they are taught explicitly to do so. Second,

there is evidence that diverse learners do forget new word meanings more quickly than normal achievers (Fawcett & Nicolson, 1991).

Matching vocabulary goals with instruction. In matching goals with instruction, judicious review offers two primary benefits. First, reviewing previously learned vocabulary words ensures that students continue to understand target words at intended levels of meaning. This is true, however, only to the extent that the review techniques match the desired depth of understanding. For example, if the word coup was learned at a deep level of understanding, in which its standard definition (i.e., a sudden successful stroke or act) as well as its relation to military takeovers and 20th century politics was explained, then review activities should reflect the richness of this understanding. If, on the other hand, review activities only address the standard definition of coup, then many students may forget the deeper meaning of the word.

The second and perhaps more significant benefit of reviewing previously learned vocabulary is that it sets the stage for learning words at a deeper level of understanding. For example, a student might initially learn that a bank is a place to safely keep money. In reviewing the meaning of bank over time, however, students might learn more about banks as lending institutions (e.g., services provided, titles of the individuals who work in a bank, the names of common banks), as well as different meanings of bank, including piled-up cloud mass, inclination of an airplane, type of shot in pool or basketball, and the rising ground bordering a lake, river, or sea.

Enhancing independent vocabulary growth. If textbooks and classroom assignments continue to challenge students to expand their vocabulary knowledge, an important component of maintaining and enhancing student independent word learning skills is achieved. However, if students are not continually challenged to expand their vocabularies, the degree to which they learn word meanings

independently may begin to be reduced. This reduction in student independent learning is more of an issue for diverse learners than normal achievers. Diverse learners are less likely to have been exposed to the "rich" language environments that characterize the experiences of many normal achievers. This "rich" experience with language may provide the necessary context needed for word learning that characterizes many life-long word learners. Teachers can play a critical role in helping diverse learners develop into life-long word learners by consistently reviewing the importance of vocabulary development by verbally reinforcing their students for independent word-learning efforts and by assigning classroom activities that require a range of independent word-learning strategies.

Students also may reduce the extent to which they investigate word meanings independently if they begin to view the vocabulary demands as too difficult. In cases such as these, teachers can respond in at least a couple of ways. First, they can provide more scaffolding and reduce the amount of vocabulary learning students need to do independently. Second, they can reduce the number of new vocabulary words to which students are exposed. For example, teachers might shift from teaching more words at less depth (i.e., verbal association knowledge) to achieving greater depth of word knowledge (i.e., full concept knowledge).

The point is that until students have developed a sustaining drive to understand the meaning of words, judicious review activities must be incorporated to ensure that students (a) understand the importance of learning word meanings, (b) use effective strategies to learn word meanings, and (c) make consistent progress in using the words they are learning.

Conclusion

The need for comprehensive programs to increase the vocabulary skills of diverse learners is clear. For instance, many diverse learners have sizable vocabulary delays compared to normal achievers even before kindergarten.

Moreover, the vocabulary gap between students tends to increase significantly over time and exacts profound consequences on reading achievement and success in content-area subjects.

Most vocabulary research has been conducted with students in the late primary- and middle-school grades, focusing primarily on evaluating the effectiveness of interventions to increase student learning of individual words. The evidence indicates that nearly all intervention methods are successful to some degree, especially when compared to gains that occur during typical incidental learning opportunities. To date, however, no single method has been demonstrated as meaningfully reducing the vocabulary gap between students with poor vocabularies and students with rich vocabularies. With few exceptions, comprehensive vocabulary programs with the potential to reduce the vocabulary gap between students have been proposed in various forms but have not been investigated empirically.

In this section, we described a framework for (a) increasing the vocabulary skills of diverse learners and (b) reducing the vocabulary gap between students. In reviewing the recent literature on vocabulary learning and diverse learners, we identified five areas of convergence. From these areas of convergence, two big ideas were derived that provide the framework for discussing a comprehensive vocabulary development program. These big ideas were:

- Interventions to address the vocabulary delays of diverse learners should align goals for depth of word knowledge with instructional techniques;
- Interventions to increase the vocabulary knowledge of diverse learners should move systematically toward ensuring that students become independent word learners.

From these big ideas, five principles of instructional design were used to structure the comprehensive intervention framework: conspicuous strategies,

strategic integration, mediated scaffolding, primed background knowledge, and judicious review. Each of these principles has received empirical support as increasing the academic achievement of diverse learners. Although many of these principles have been validated for increasing the vocabulary skills of diverse learners in isolation, they have not been used in a comprehensive way to increase vocabulary growth and decrease the vocabulary gap between students. Thus, it is imperative that the effectiveness of comprehensive vocabulary programs is monitored carefully and that programmatic changes are made when student growth is not adequate.

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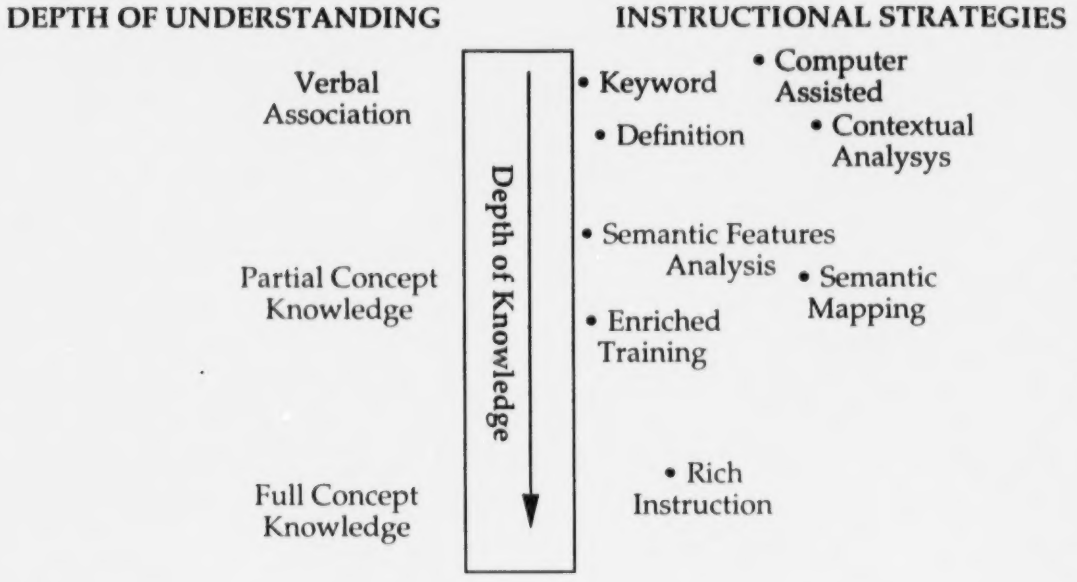
Figure Caption

Figure 1. Evaluating the alignment between goals for depth of word knowledge and instructional technique.


DEPTH OF UNDERSTANDING
INSTRUCTIONAL STRATEGIES
Verbal Association
Partial Concept Knowledge
Full Concept Knowledge
Depth of Knowledge
• Keyword
• Computer Assisted
• Definition
• Contextual Analysys
• Semantic Features Analysis
• Semantic Mapping
• Enriched Training
• Rich Instruction